Parks and Protected Areas: Their Contribution to the Alberta Economy

A DISCUSSION PAPER

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This discussion paper has been prepared for the purposes of obtaining a better understanding of the roles and importance of parks and protected areas. It is intended to foster informed debate and not to prescribe any particular conclusions or actions. This draft builds on review comments provided by representatives of:

- Alberta Agriculture and Rural Development
- Alberta Economic Development and Tourism
- Alberta Energy
- Alberta Environmental Protection, Natural Resources Service
- Alberta Treasury
- Department of Rural Economy, University of Alberta

The opinions and conclusions presented herein are those of the authors and do not necessarily represent the position of Alberta Environmental Protection.

EXECUTIVE SUMMARY

Alberta's current system of protected areas covers approximately 6.5 million hectares. The majority of this land is located in national parks (5.4 million hectares) with the balance being protected through some form of provincial designation, including provincial parks and recreation areas. The purpose of this paper is to describe how this system of protected acreas contributes to the economy of Alberta. It focuses only on recreation and tourism, although parks and protected areas also provide a broad range of social, environmental and other economic benefits.

In 1993/94, visitors to the national parks and the major provincial parks in Alberta spent about $1.2 billion on goods and services related to their visits. These expenditures directly contributed about $496 million toward Alberta gross domestic product (GDP) and created 15,075 person-years of employment. When indirect and induced effects are included, this impact increased to $975 million in GDP and 22,260 person-years. Provincial and federal governments expenditures to operate and maintain these areas generated an additional $85 million in GDP and the equivalent of 2,220 additional full-time jobs. Altogether, this economic activity accounts for about 1.5 percent of total Alberta GDP in 1993/94 and 2.0 percent of employment.

In comparison, the agriculture, energy and forestry sectors directly and indirectly contributed about $29 billion in economic activity. These sectors accounted for 40 percent of Alberta GDP in 1993, and directly and indirectly employed 435,000 people, or about 35 percent of provincial employment.

The economic contributions of parks and protected areas appear small in relation to these other sectors. However, when these economic impacts are adjusted to reflect the amount of land allocated to the various sectors, the contributions of parks and protected areas are comparable to those of the other sectors. The agriculture and forestry sectors generate between $210 and $415 per hectare of land, while parks and protected areas contribute $190 per hectare. In terms of employment, parks and protected areas create about 44 person-years of employment per 100 square kilometres, while forestry generated somewhere between 33 and 65 person-years. Thus, on average, the economic contributions of parks and protected areas are comparable to those of other resource-based sectors.

The analysis also shows that intensively-managed provincial parks and recreation areas can actually generate very high levels of economic activity: $940 per hectare and 243 person-years of employment per 100 km^2. These numbers are higher than the forestry and agriculture sectors. These values also appear to be about 10 times higher than similar estimates for parks in British Columbia, Saskatchewan and Ontario. However, part of the difference among provinces is due to the fact that provincial parks and recreation areas in Alberta are used much more intensively (more visits per hectare) than in the other provinces.

The major conclusion of this analysis is that parks and other protected areas do contribute to the provincial economy. Depending on the circumstances, parks and protected areas can contribute as much to the provincial economy per unit of land as other types of resource development, such as agriculture or forestry.

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1.0 Introduction

As more and more of the provincial land base is being considered for development, resource managers are faced with the difficult problem of trying to balance economic growth and environmental protection. In defining this balance, one common concern is that too much protection will impair potential economic growth.

Proponents of more growth are quick to point out the economic benefits of development. For forestry, mining, oil and gas, or agriculture, these economic benefits are easily quantified in terms of dollars and jobs.

On the other hand, proponents of increased environmental protection have considerable difficulty demonstrating the benefits of protection. While there is increasing public support for preserving biodiversity and ecosystems, the resulting ecological and environmental benefits fall outside the marketplace and are very difficult to measure in terms of dollars or jobs. Thus, proposals for expanding a system of parks and protected areas are often debated in terms of the costs associated with lost opportunities for development, rather than on the benefits of protection.

To date, most economic research has focussed on the extent to which parks and protected areas support recreation and tourism. For example, both British Columbia and Ontario recently estimated the benefits of their park systems in terms of the direct and indirect economic impacts associated with spending by parks visitors. This approach offers a very narrow perspective on the value of parks and protected areas, but it shows that their contributions to the provincial and regional economy can be sizeable.

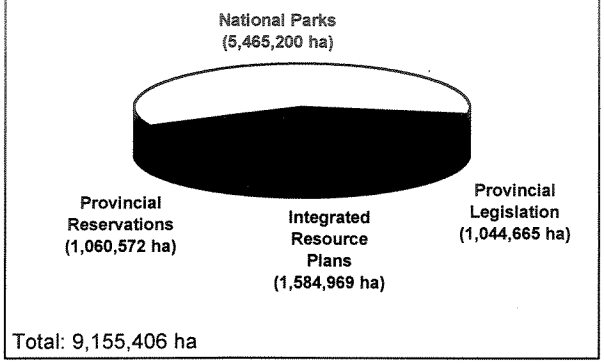
The purpose of this report is to provide an assessment of the extent to which parks and protected areas contribute to the economy of Alberta. This analysis focusses only on recreation and tourism, as measured in terms of the impacts of spending by visitors to parks and protected areas, and uses 1993/94 as the base year.[1] The report offers several interpretations of the resulting economic impacts, especially in comparison to the impacts of the agriculture, forestry and oil and gas sectors.

[1] This year was chosen because, at the time of writing, it was the most recent year for which all pertinent data were available.

2.0
Parks and Protected Areas in Alberta

Within Alberta some 9.15 million hectares of land are considered to be protected areas.[1] As shown in Figure 1, the level of protection for these lands ranges from formal designations through legislation (like provincial and national parks), to lands zoned for protection within Integrated Resource Plans (IRPs), to lands held under various forms of reservation. A complete summary of these protected areas in Alberta is provided in Appendix A.

Figure 1
Protected Areas in Alberta,1994, by Type of Designation



Total: 9,155,406 ha

Of direct relevance to this paper are parks and protected areas established under legislation. The amount of land protected through legislation totals 6.51 million hectares and represents 9.85 percent of the provincial land base.[2] The remaining 2.64 million hectares of land are only partially protected through zoning and reservation and have been excluded from this analysis.

Five national parks account for the majority of the legislated parks and protected areas in Alberta. Banff, Jasper, Waterton Lakes, Elk Island, and Wood Buffalo national parks cover some 5.4 million hectares - nearly 80 percent of the total parks and protected areas. Other types of protected areas created through federal legislation include four national wildlife areas, six national historic sites, and four migratory bird sanctuaries.

Various types of parks and protected areas have been established under provincial legislation. These include 65 provincial parks, three wilderness areas, one wilderness park, 14 ecological reserves, and 123 natural areas. Other formally-protected areas in Alberta include 200 provincial recreation areas, two wildlife habitat development areas, 13 wildlife and bird sanctuaries, and 188 forest recreation areas.

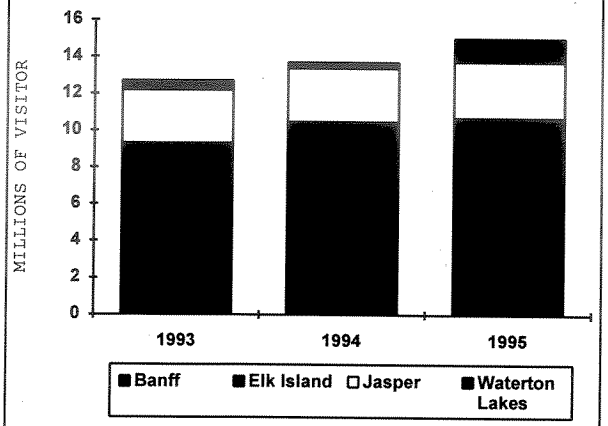
[1] This does not include lands designated as Special Places since October 1994.

[2] This includes all land areas classed as Special Places 2000 Categories and Other Designations in Appendix A, but excludes Forest Land Use Zones.

2.1 Recreation and Tourism

From the perspective of recreation and tourism, the most important types of protected areas include the five national parks, 65 provincial parks, and 241 provincial recreation areas. These areas are actively managed for recreation and tourism, and visitation to many of these areas is monitored annually. These visitation statistics provide a basis for estimating the extent to which these areas are contributing to the Alberta economy.

Figure 2
Visits to National Parks in Alberta, 1993-1995



Source: Canadian Heritage, Alberta Region

In 1993, some 12.7 million people visited one of the five national parks in Alberta and spent 15.5 million days in the parks. Of these, 9.2 million people visited Banff National Park while 2.9 million went to Jasper National Park. As shown in Figure 2, the number of people visiting the other national parks was relatively small in comparison.[1] Since 1993, the number of visits to national parks has been increasing by about 4.5 percent per year. About 52 percent of park visitors were residents of Alberta.

Visitation statistics for provincial parks and many provincial recreation areas are collected by Alberta Environmental Protection.[2] In 1993/94, visitation to these sites amounted to about 9.1 million user-days.[3] Of this, some 7.3 million people made day-use visits, while overnight camping activity amounted to 1.5 million camper-nights. The remaining 0.3 million user-days consisted of people using fixed roof accommodation in Kananaskis Country and people using group campsites.

Figure 3 shows that this pattern of usage has been gradually increasing in recent years. The total number of visitors increased by 40 percent between 1987/88 and 1993/94. This represents an average annual rate of increase of nearly six percent. It is estimated that

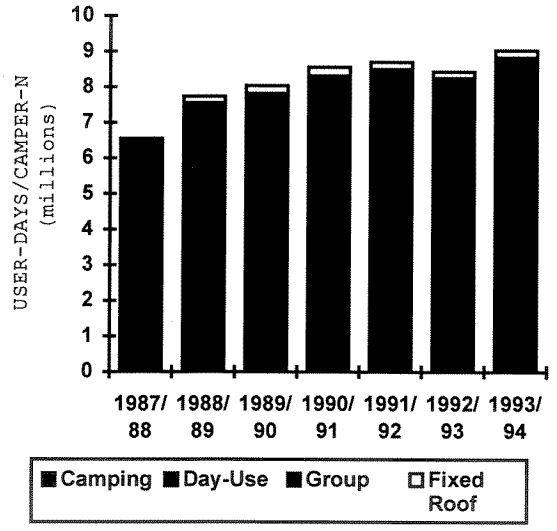
1 Visitation to Wood Buffalo Park is not included in these numbers but annual visitation was less than 7,000 people in 1993.

2 Statistics are reported for 182 parks and recreation areas with a combined size of 144,074 hectares.

3 Alberta Environmental Protection. Park User Statistics 1993/94. Natural Resources Service, Parks Management Support Division.

about 95 percent of visitors to provincial parks and recreation areas are Albertans.

Figure 3
Visits to Alberta Provincial Parks and Recreation Areas, 1987/88 to 1993/94



These statistics provide only a partial picture of recreational and tourist use of protected areas. Visitation to other types of protected areas is not recorded. For example, many Albertans and non-residents visit the three provincial wilderness areas, Willmore Wilderness Park, and the forest recreation areas, but records of camping and day-use visits to these areas are incomplete.[1] Thus, the available park visitation statistics considerably understate recreational and tourist use of protected areas in Alberta.

2.2 Other Benefits of Parks and Protected Areas

Aside from providing opportunities for recreation and tourism, parks and protected areas provide a wide range of environmental, social and economic benefits. These include:

- protecting rare and endangered plants and animals and their habitats;
- protecting water quality and quantity;
- maintaining the abundance and diversity of native species and habitats;
- allowing management of environmentally-sensitive areas, including wetlands, watersheds, and critical wildlife areas;
- providing opportunities for natural history interpretation and education; and,
- protecting important heritage features and facilities.

There is no doubt that these benefits contribute to the quality of life for Albertans and for visitors to the province. However, the extent of these contributions to social well-being is seldom if ever measured or quantified in economic terms. As a result, this assessment, which focuses only on the value of recreation and tourism, provides only a partial assessment of the true contributions of parks and protected areas.

[1] Partial records exist for visitation to forest recreation areas. In 1993/94, visitation to these sites was about 227,000 camper-night and day-use, where measured, amounted to at least 17,000 user-days. However, total visitation to these sites could be much larger. A study of auto access camping in 1987 (Thompson Economic Consulting Services, 1989) estimated 632,400 nights of camping at formal camping sites in the province compared to 1.2 million at provincial parks and 1.0 million for the mountain parks. Thus, total camping at all protected areas in Alberta could be as much as 25 percent greater than reported.

3.0
The Economic Impact of Parks and Protected Areas

The impact or importance of a specific project, program or industry is often described in terms of its effects on the provincial economy, as measured in terms of gross domestic product (GDP)[1] and employment. In Alberta, GDP and employment are two of the key indicators used to measure economic performance.

Parks and protected areas in Alberta generate several types of impacts on GDP and employment. These impacts result from two forms of economic activity:

- expenditures made by governments to create, operate and maintain these areas; and,
- purchases of goods and services by park visitors on such things as restaurant meals, groceries, gasoline and oil, vehicle repairs, retail items and souvenirs, and various recreational and tourist attractions.

These purchases affect economic activity and employment in several ways. There is an initial ***direct*** impact for Alberta businesses that sell goods and services to park visitors and to the government departments responsible for parks and protected areas.

Two types of secondary economic impacts also occur. ***Indirect*** impacts occur when Alberta businesses produce some of the goods and services being sold to park visitors and to government departments. ***Induced*** impacts occur when people employed by these businesses spend part of their wages on other goods and services in Alberta. Thus, the total economic impacts associated with parks and protected areas extend beyond the direct purchases made by park visitors and government departments.

Models of the Alberta and Canadian economies have been developed to estimate the direct, indirect and induced impacts resulting from various types of economic activity. These models are constructed to describe the linkages between the various sectors within the economy. By understanding these linkages, it is possible to predict how expenditures in one or more sectors will affect total provincial GDP and employment. The estimates provided in this report are based mainly on the 1990 input-

[1] GDP is a measure of the total value of all the final goods and services produced within a provincial economy over a given year. Goods used to produce other goods are excluded from GDP because their value is included in the price of a final good. The value of goods imported into Alberta is also excluded.

output model developed by Alberta Treasury. Their model is similar to the one prepared by Statistics Canada but has been modified to capture the effects of the Goods and Services Tax.

Economic impacts should not be confused with economic benefits. Impacts merely describe the amount of economic activity associated with a particular product and do not differentiate between benefits and costs. As a result, an event like an oil spill or an earthquake can impose significant social costs, but efforts to clean up will generate economic activity that can increase GDP and employment. The disadvantages of making decisions based on economic impacts are well documented.[1] Despite these problems, impact studies are still routinely prepared and GDP and employment are used as standard indicators of the economic health of the province.

3.1 Provincial Parks and Recreation Areas

The economic impacts associated with Alberta provincial parks and recreation areas were estimated in a recent study by Alberta Environmental Protection[2]. This study determined that in 1992/93, visitors to provincial parks and major recreation areas spent a total of $185 million during their park visits. An itemized summary of their expenditures is provided in Table 1.

Table 1
Summary of Expenditures by Visitors to Provincial Parks and Recreation Areas, 1992/93

	Total (millions)	Percent of Total
Camping fees	$3.7	2.0%
Meals/Refreshments	$44.7	24.2%
Groceries	$20.3	11.0%
Vehicle expenses	$52.4	28.4%
Recreation and Entertainment	$23.8	12.9%
Retail purchases	$21.9	11.8%
Miscellaneous	$5.4	3.0%
Other	$12.3	6.7%
Total	$184.5	100.00%

Source: Albert Environmental Protection, 1994

In that same year, the Alberta Parks Service spent $42.3 million and required the equivalent of 692.9 person-years of employment to operate and maintain the provincial parks system.

The economic impacts estimated in the 1994 study were originally determined using multiplier coefficients based on the 1984 input-output model of the Alberta economy. However, the recent release of the 1990 model provided an opportunity to revise these numbers to reflect changes in the structure of the provincial economy since 1984 and to capture the effects of the Goods and Services Tax. Alberta Treasury recalculated economic impacts using their

[1] For example see Cobb et. al. 1995.

[2] Alberta Environmental Protection, 1994. Impact of Provincial Parks and Recreational Areas on the Alberta Economy , Internal Paper.

1990 input-output model and the expenditure data summarized in Table 1.[1]

According to the analysis prepared by Alberta Treasury, spending by people visiting provincial parks and major recreation areas in Alberta contributed about $125 million to provincial GDP, primarily in the service and trade sectors, and created 3,270 person-years of employment.

Table 2
Economic Impact of Expenditures by Park Visitors, 1992/93

	Gross Domestic Product. (millions)	Employment (Person-Years)
Direct Impacts	$64.3	2,170
Induced & Indirect Impacts	$60.9	1,100
Total Impacts	$125.2	3,270

Source: Alberta Treasury, 1996.

This shows that every dollar spent by visitors to parks and recreation areas in Alberta generated about 67 cents in economic activity within the province.[2] The analysis also indicated that spending by park visitors generated $8.9 million in tax revenue for the provincial government.

Additional economic impacts were generated as a result of government spending to operate and maintain the provincial parks system. Total impacts on GDP amounted to $44.0 million, the majority of which consisted of wages and salaries paid directly to department and contract staff ($25.0 million). Total impacts on employment associated with parks operation and maintenance amounted to 1,115 person-years.

In total, the quantifiable economic impacts associated with provincial parks and recreation areas in Alberta in 1992/93 amounted to $169.2 million in provincial GDP and nearly 4,400 person-years of employment. About three-quarters of this is attributable to spending by parks visitors.

Estimates of the economic impacts of provincial parks and recreation areas for the 1993/94 fiscal year are summarized in Table 3 and were developed by updating the 1992/93 data to reflect inflation, increased visitation and changes in operating budgets.

Table 3
Economic Impact Associated with Alberta Provincial Parks and Recreation Areas, 1993/94

	Gross Domestic Product. (millions)	Employment (Person-Years)
Park Visitors	$134.9	3,500
Parks Operations	$41.5	1,085
Total Impacts	$176.4	4,585

[1] Camping and other park fees can be counted as either a cost for park visitors or as a source of revenues to cover some of the costs of operating the parks system, but not both. In this analysis, the economic impacts associated with visitor spending exclude the costs of camping fees.

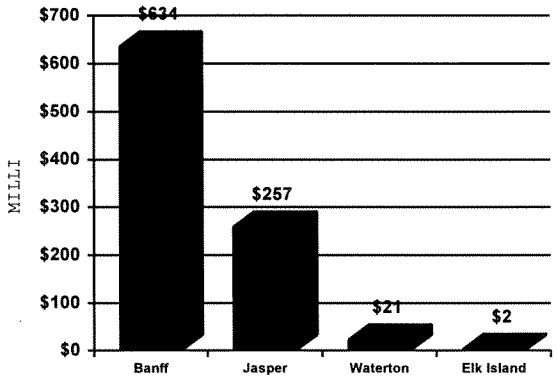
[2] Impacts on GDP are smaller than the value of purchases by park visitors because many of these goods had to be imported into Alberta and represent leakage from the provincial economy.

The impacts associated with park visitors are nearly eight percent larger than in 1992/93 because of increased park visitation (see Figure 3). For park operations and maintenance, 1993/94 estimates are similar to those for 1992/93.[1] Thus, the quantifiable economic impacts associated with parks and protected areas in Alberta in 1993/94 amounted to $176.4 million in GDP and 4,585 person-years of employment.

3.2 National Parks

The economic impacts associated with national parks in Alberta were calculated for 1987[2] but more recent estimates were prepared for Banff, Jasper and Waterton national parks in 1991[3]. For the purpose of this analysis, estimates of visitor spending are based on 1991 data, adjusted for inflation and recent increases in park visitation. Economic impacts were estimated using multipliers from the 1987 analysis which is considered to be more accurate.[4]

Figure 4
Estimated Spending by Visitors to National Parks in Alberta, 1993



Based on this approach, spending by visitors to the major national parks in Alberta in 1993 is estimated to have been $914 million. As shown in Figure 4, the majority of this ($634 million or 69 percent) is associated with visitors to Banff National Park. Total spending by visitors to national parks contributed $840 million toward provincial GDP in 1993 and generated 18,760 person-years of employment.

Table 4
Economic Impact Associated with Visitors to National Parks in Alberta, 1993

National Park	Gross Domestic Product. (millions)	Employment (Person-Years)
Banff	$582.7	13,010
Jasper	$236.6	5,280
Waterton Lakes	$19.7	440
Elk Island	$1.5	30
Total Impacts	$840.5	18,760

1 The parks budget decreased by six percent between 1993/94 and 1992/93 to $39.9 million and employment decreased to 674 person-years.

2 Canadian Parks Service. 1989. The Impact on the Provincial Economy of the National Parks of Alberta.

3 In 1994, Alberta Economic Development and Tourism prepared estimates of the economic impacts for Banff, Jasper and Waterton National Parks based on 1991 visitation and using the Demand Economic Impact Model (DEIM).

4 The economic multipliers resulting from the 1987 study of visitor spending in the national parks were slightly higher than but similar to those produced when Alberta Treasury analyzed the effects of spending by visitors to provincial parks (1996). This is expected since the patterns of expenditures by both types of visitors is relatively the same. In contrast, the DEIM model used in the 1991 study yielded multipliers that were 30 percent higher than those of the 1987 study.

The 1993/94 capital and operating budget for the national parks in Alberta amounted to $39.6 million.[1] This includes $18.1 million for Banff, $15.1 million for Jasper, $3.8 million for Waterton Lakes, and $2.6 million for Elk Island. About 32 percent of the overall budget was for capital items. The total impacts on the Alberta economy are estimated to be on the order of $41.2 million in GDP and 1,050 person-years of employment.[2]

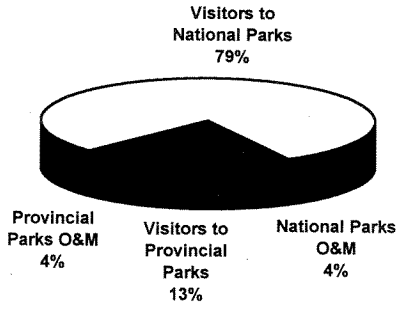
Table 5
Economic Impact Associated with National Parks in Alberta, 1993/94

	Gross Domestic Product. (millions)	Employment (Person-Years)
Park Visitors	$840.5	18,760
Parks Operations	$41.2	1,050
Total Impacts	$881.7	19,810

3.3 Summary

Together, national and provincial parks, recreation areas and other protected areas in Alberta are estimated to have directly contributed at least $1,060 million to provincial GDP. Nearly 92 percent of these impacts are associated with the spending by park visitors. As shown in Figure 5, people visiting national parks in Alberta accounted for the majority (79 percent) of impacts on GDP.

Figure 5
Sources of Park-Related Impacts on Alberta GDP, 1993/94



Employment impacts associated with national and provincial parks and protected areas in Alberta totalled 24,480 person-years. About 19 percent of this is associated with provincial parks and recreation areas. The balance (81 percent) results from visitation to and operation of the national parks.

Table 6
Economic Impacts Associated with Parks and Protected Areas in Alberta, 1993/94

	Gross Domestic Product. (millions)	Employment (Person-Years)
Provincial Parks:		
• Visitors	$134.9	3,500
• Operations	$43.7	1,170
National Parks		
• Visitors	$840.5	18,760
• Operations	$41.2	1,050
Total Impacts	$1,060.3	24,480
Direct Impacts		
• Visitors	$496.2	15,075
• Operation	$48.3	1,460
Total Direct	$544.53	16,535
Indirect & Induced		
• Visitors	$479.2	7,190
• Operations	$36.6	755
Total Indirect & Induced	$515.8	7,945

[1] Provided by Canadian Heritage, Parks Canada, Alberta Region and excludes the budget for Wood Buffalo National Park.

[2] These impacts were estimated assuming that the proportion of the budget spent on wages and benefits and the average wage per person-year of employment were that same as for provincial parks.

Table 6 also shows that 47 percent of total impacts on GDP ($496 million) and 62 percent of impacts on total employment (15,075 person-years) are directly related to spending by park visitors. Another five percent of GDP and employment impacts are directly related to park operations. Induced and indirect effects account for the balance.

As noted earlier, there are various other categories of protected areas in Alberta aside from national and provincial parks and recreation areas. These include wilderness areas, ecological reserves, forest recreation areas, and natural areas as well as Willmore Wilderness Park. Although these areas are used for recreational purposes, visitation statistics are incomplete and there is no information on the amounts of money being spent by people who visit these sites. Consequently, the economic contributions of these areas in terms of recreation and tourism cannot be quantified. This means that the estimates of the economic impacts associated with protected areas in Alberta, as described in this report, are partial estimates and the total impact could actually be much greater.

4.0
Economic Significance

There are several ways to interpret the significance of the economic impacts associated with parks and protected areas. The usual approach is to compare these impacts against total provincial economic output and employment. It is also possible to make comparisons to other sectors of the economy in terms of their contributions toward provincial GDP and employment.

4.1 Provincial Significance

Estimates of economic output, as measured in terms of GDP, are developed annually by Alberta Treasury. For 1993, Alberta GDP was determined to be $72.7 billion.[1] Although employment numbers vary from month to month, an average of 1.25 million Albertans were employed during 1993.[2]

Together, national and provincial parks, recreation areas and other protected areas in Alberta are estimated to have directly and indirectly contributed at least $975 million to provincial GDP through the expenditures of tourists and other parks visitors. This represents 1.3 percent of provincial GDP for 1993. Similarly, spending by park visitors created at least 22,260 person-years of employment. This is equivalent to 1.8 percent of provincial employment.

If government expenditures made to operate and maintain national and provincial parks and provincial recreation areas are included, the overall contribution to Alberta GDP increases to about 1.5 percent. Similarly, visitation to and operation of parks and protected areas generates nearly 2.0 percent of provincial employment.

4.2 Sectoral Significance: Direct Impacts

A considerable proportion of economic activity in Alberta is tied directly to natural resources. The data in Table 7 show that the energy, forestry and agricultural sectors directly contributed $16.4 billion toward provincial GDP in 1993.[3] This amount represents 23 percent of total GDP. Furthermore, this number increases to $17.4 billion if the final value of wood products and pulp and paper production are included. About one in seven jobs in Alberta is directly tied to one of these three resource sectors.

[1] Alberta Treasury. 1994. Alberta Economic Accounts.

[2] Alberta Advanced Education and Career Development. Labour Force Statistics, January 1994 to December 1994.

[3] This amount includes income from natural resource royalties.

Table 7

Alberta Gross Domestic Product At Factor Cost for 1993

Sector	GDP (millions)	Percentage of Total	Employment (person-years)	Percentage of Total
Agriculture	$2,009	2.8%	87,900	7.0%
Energy (including Mining)	$11,851	16.3%	68,700	5.5%
Forestry*	$330	0.5%	3,500	0.3%
Natural Resource Royalties	$2,214	3.0%	n/a	n/a
Manufacturing	$6,493	8.9%	96,200	7.7%
Utilities**	$2,786	3.8%	n/a	n/a
Construction	$4,764	6.6%	80,500	6.4%
Transportation, Storage & Communication	$5,660	7.8%	90,200	7.2%
Trade	$7,468	10.3%	223,100	17.8%
Finance, Insurance and Real Estate	$10,318	14.2%	65.200	5.2%
Public Administration	$3,975	5.5%	77,500	6.2%
Services	$15,940	21.9%	458,900	36.7%
Alberta Total***	$72,685	100.0%	1,251,600	100.0%

* Forestry does not include the wood and paper industries which are included in Manufacturing.

** Employment for the Utilities sector is included with Transportation, Storage & Communications.

*** Components do not add to total because some minor sectors were excluded.

Table 8

Total Contributions of Selected Economic Sectors in Alberta, 1993

	Agriculture	Energy	Forestry*
Gross Domestic Product (billions)			
- Direct	$2,009	$11,851	$1,325
- Indirect & Induced**	$2,682	$9,925	$1,434
- Total	$4,691	$21,777	$2,759
Percent of Alberta Total	6.5%	30.0%	2.8%
Employment (person-years)			
- Direct	87,920	69,050	15,160
- Indirect & Induced	59,780	177,730	25,270
- Total	147,700	246,780	40,430
Percent of Alberta Total	11.8%	19.7%	3.2%

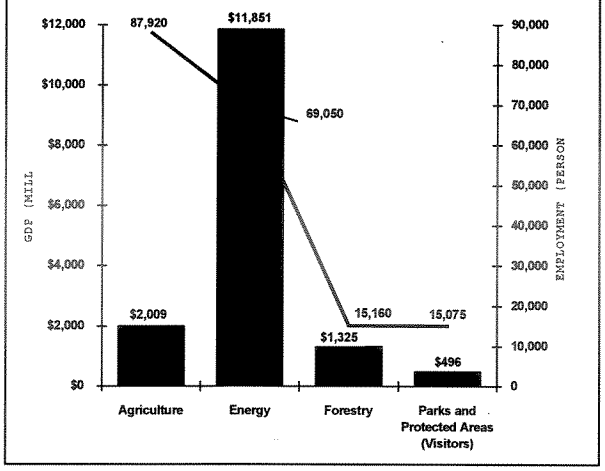
* This includes the wood and paper industries.

** Includes natural resource royalties.

In contrast, visitation to parks and protected areas in Alberta is estimated to have directly contributed about $0.5 billion toward provincial GDP.

Figure 6 compares the direct economic activity associated with parks and protected areas to the equivalent estimates for the agriculture, foresty (including wood and paper manufacturing) and energy sectors.[1]

Figure 6
Direct Contributions of Selected Economic Sectors Toward Economic Activity in Alberta, 1993



In terms of GDP, the energy sector is by far the most important. However, both the agriculture and forest sectors contribute at least three times as much toward provincial GDP as do parks and protected areas.

In terms of direct employment, agriculture is the largest sector. However, direct employment in the forest industry in 1993 was nearly identical to the number of people directly employed as a result of visitation to parks and protected areas in Alberta. Thus, parks and protected areas represent an important source of employment in Alberta.

4.3 Sectoral Significance: Total Impacts

The economic importance of the resource sectors goes well beyond their direct impacts on GDP and employment. As noted earlier, economic activity in one sector of the economy can cause indirect and induced impacts in other sectors. Thus, the development of the energy, agriculture and forest sectors has resulted in additional economic activity in manufacturing, wholesale and retail sales, and the various service sectors.

The full range of economic impacts associated with these three sectors is shown in Table 8, and was estimated using multipliers from the 1990 input-output

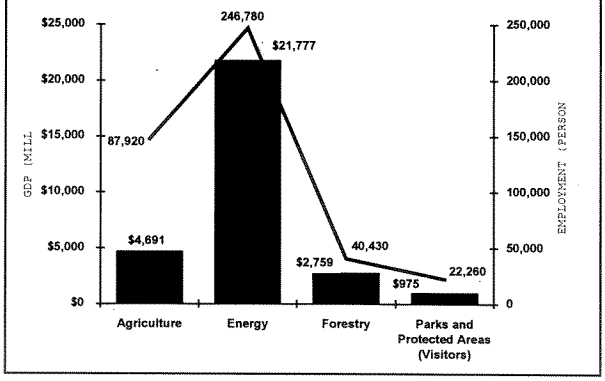
[1] In making comparisons among the various sectors, the impacts associated with government spending on park operation have been ignored. Some of these impacts could be included because government agencies are directly providing and delivering some services to park visitors. However, governments also provide support to the other resource sectors and it is very difficult to isolate which components of their budgets should be factored into the analysis. Thus, it seemed appropriate to focus only on the impacts of parks visitors in order to ensure that a consistent approach is employed throughout the analysis. In any event, the impacts associated with government spending on park operations are so relatively small that their inclusion does not significantly affect the results of the analysis.

tables.[1] The results show that, for every dollar of direct economic output in each of these sectors, another dollar of economic activity occurred elsewhere in the provincial economy.

The data in Table 8 indicate that, when indirect and induced impacts are included, the agriculture, energy and forestry sectors generated $29 billion in final goods and services. This accounted for 40 percent of Alberta GDP in 1993. These three sectors also directly and indirectly employed 435,000 people, and this represented 35 percent of provincial employment in that year.

When compared to the other resource sectors, the total GDP and employment impacts associated with parks and protected areas are still relatively small. As shown in Figure 7, the forestry sector contributed almost three times the GDP generated by parks and protected areas while the value of agricultural output was nearly five times greater. In terms of total employment, there were about 80 percent more forestry-related jobs than jobs associated with parks and protected areas.

Figure 7
Total Contributions of Selected Economic Sectors Toward Economic Activity in Alberta, 1993



In comparing direct employment impacts (Figure 6) and total employment impacts (Figure 7), one important observation is that the forestry and energy sectors generate a higher number of spin-off jobs than does spending by park visitors. For every one direct job in the energy sector there are 2.6 indirect and induced jobs elsewhere in the economy. This compares to 1.7 for forestry, 0.7 for agriculture and only 0.5 for parks and protected areas.

[1] It is not possible to completely validate the reliability of estimates based on the input-output tables, because of limits to the accuracy of the multiplier coefficients. However, a recent study of the Alberta forest industry by Price Waterhouse (1994) indicated that total employment associated with the forest industry in 1992 was on the order of 45,000 to 52,500 people. Furthermore they calculated total personal earnings to have been $1.8 billion. Using GDP to income ratios for the forest industry this would suggest that the forest industry contributed about $3.0 billion. Another study by the Canadian Forest Services (1995) estimated direct and indirect employment in the Alberta forest industry to have been 34,000 people. Thus, the estimate of GDP impact from the forest sector in Table 8 is quite close to information from other sources and the estimated employment impact falls between the two other estimates

5.0
Significance According to Land Base

One explanation for the relatively small economic contributions of parks and protected areas relates to the size of the land base allocated to these uses. Compared to the resource sectors like agriculture, forestry and oil and gas development, relatively little land has been allocated to parks and protected areas. On this basis, it may be expected that parks and protected would have a smaller impact on provincial economic activity. An alternative measure of the relative importance of various economic activities could be then achieved by estimating GDP and employment impacts per unit of land unit (i.e. per hectare).

5.1 Determination of the Land Base

The key task in applying this approach involves estimating the land base allocated to or used by each of the four economic sectors. This is relatively easy for agriculture and for parks and protected areas.

As reported in Section 2.0, a total of 6.5 million hectares of land in Alberta have been designated through legislation as parks or protected areas.[1] National parks account for 5.4 million hectares. The land area for provincial parks and recreation areas for which visitation data exist amounts to 144,100 hectares.

Estimates of the agricultural land base are available from Statistics Canada. According to the 1991 Census of Agriculture, agricultural activities in Alberta occur on about 19.5 million hectares. This includes 12.8 million hectares of cropland and improved pasture, and 6.7 million hectares of unimproved pasture.

It is much more difficult to provide specific estimates of the land base allocated to the forestry sectors. Forestry occurs on both public and private lands, and resource allocations on public lands are based on timber volumes rather than land area. Furthermore, multiple activities (including agriculture, energy and recreation) can occur on the same piece of land.

The forest industry relies on managed timber in the Green Area[2] of Alberta, which covers nearly 35 million hectares primarily in northern Alberta. However, a large portion

[1] A detailed description of the amount of land associated with each of the various categories of land designated or reserved for protection is provided in Appendix A.

[2] Alberta's Green Areas are forested lands withdrawn from settlement that are managed for forestry and other multiple uses. Some timber is also obtained from private lands in the White Area.

of this area is either non-productive or marginally productive forest and cannot be considered part of the commercial forestry land base. In total, about 22.5 million hectares of land are considered productive forest.[1]

At the same time, only 13.5 million hectares of forested lands have been allocated under Forest Management Agreements (FMAs) which support major operations, such as pulp and paper mills. This area includes both productive and non-productive timber areas, and not all of the land base within FMAs are actually used for timber harvesting.[2] Not included under FMAs are smaller timber agreements and private timber stands which support smaller operations such as sawmills, but, in total, represent a sizable portion of the productive forest.

Another method for determining the forestry land base is to determine the amount of land required to support and sustain the actual timber harvest in 1993/94. Based on a combined coniferous-deciduous harvest of 13.1 million cubic metres of wood and an average annual growth of 1.96 cubic metres per hectare, some 6.7 million hectares of land would be required to sustain forestry operations.[3] However, this number does not include lands used for haul roads or the lands needed to offset forest losses due to fires, insects and disease.

A best estimate of the land base required for the forest sector falls somewhere between the maximum allocation (13.5 million hectares) and the land base actually being harvested (6.7 million hectares). Although this range of values is used in the analysis, the best estimate is closer to 6.7 million hectares.

Estimation of the land area used by the energy sector is even more problematic. The simplest approach is to include all the land areas covered by active sub-surface mineral leases and licenses required by the provincial government for exploration or development. In 1993, land areas licensed or leased for oil and gas amounted to over 29.2 million hectares. Oil sands and coal leases accounted for another 2.0 million and 0.6 million hectares, respectively. A minor number of leases were held by quarries, sand pits and other mining operations. Total land allocations for the energy sector amounted to about 31.9 million hectares.

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1 Alberta Environmental Protection, 1996. The Status of Alberta's Timber Supply.

2 As of December 31, 1995, some 13.6 million hectares of land had been allocated as part of 11 FMAs, with another 1.9 million hectares being held in reserve for FMA expansions pending government approval. And, while Al-Pac had an FMA of 5.8 million ha, the mill was not operational in 1993.

3 Personal communications with Todd Nash, Land and Forest Service, Alberta Environmental Protection, September, 1996. These numbers are approximations developed specifically for this analysis.

There are several major problems with this estimate, however. Oil and gas leases are issued for land with producing wells that generate high economic values but leases are also issued for exploratory purposes, where economic values are very low. In addition, more than one sub-surface oil and gas lease can be issued for the same piece of land. One lease may be for a zone 500 meters below the surface and another may be issued for 1000 meters below the surface. Alberta Energy suggests the extent of potential overlaps on surface rights dispositions to be in the range of 10 and 30 percent.

For want of a better method for estimating the land base used by the energy sector, this analysis uses the amount of active sub-surface mineral leases and licenses, adjusted to eliminate potential overlap. Thus, the total land areas associated with the energy sector are assumed to be in the range of 23.0 million hectares (30 percent overlap) to 28.9 million hectares (10 percent overlap). However, these numbers are known to overstate the amount of land actually being used by the energy sector.

5.2 Economic Impacts by Land Base

Calculation of the economic impacts per unit of land for each of the various resource sectors involves combining the impact data from tables 6 and 8 with the information on land area. The resulting estimates of the average GDP and employment contributions per unit of land are shown in Table 9 for the three major resource sectors and in Table 10 for the various types of parks and protected areas.

Table 9 shows that energy is the most productive among the major resource sectors. The energy sector contributes an average of about $410 to $515 per hectare toward provincial GDP with between 24 and 30 person-years of employment per 100 square kilometres (km^2).[1]

Forestry is the second highest economic contributor per land area. Average GDP per hectare is on the order of $198 for the land base actually being harvested, but would drop to $100 if the maximum land allocation is used. This is less than half of what the energy sector contributes toward provincial economic output on a per hectare basis. However, forestry is slightly less labour intensive, so the maximum employment impacts are in the range of about 22 to 11 person-years per 100 km^2.

Per hectare, the average economic contributions of the agricultural sector are below those of the energy and forestry sectors. In terms of GDP, agriculture

[1] Employment impacts are expressed in terms of person-years per 100 square kilometres rather than per hectare so that the resulting estimates are greater than one.

Table 9

Economic Contributions of Various Resource Sectors in Alberta, by Land Area, 1993

Indicator		Agriculture	Energy	Forestry
Direct GDP (millions)		$2,009	$11,851	$1,325
Direct Employment		87,920	69,050	15,160
Land Base (hectares)	High	19,488,260[1]	28,900,000[2]	13,315,400[3]
	Low	19,488,260	23,000,000[4]	6,680,000[5]
Direct GDP per Hectare	High	$103	$410	$100
	Low	$103	$515	$198
Direct Employment per 100 sq. km.	High	45	24	11
	Low	45	30	22

Table 10

Economic Contributions of Various Classes of Parks and Protected Areas in Alberta, by Land Area, 1993[6]

Indicator	All Parks and Protected Areas	Provincial Parks & Recreation Areas[7]	National Parks
Direct GDP (millions)	$496	$69	$427
Direct Employment	15,075	2,325	12,750
Land Base (hectares)	5,552,540	144,100	5,408,440
Direct GDP per Hectare	$89	$479	$79
Direct Employment per 100 sq. km.	27	161	23

1 Includes cropland and improved pasture (12,811,336 ha) and unimproved pasture (6,676,923 ha).

2 Includes land covered by active sub-surface mineral leases and licences issued for exploration and development (29,241,146 ha), assuming a 10 percent overlap, plus lands allocated to oil sands (1,999,000 ha) and coal developments (650,000 ha).

3 Lands allocated to Forest Management Agreements.

4 Includes land covered by active sub-surface mineral leases and licences issued for exploration and development (29,241,146 ha), assuming a 30 percent overlap, plus lands allocated to oil sands (1,999,000 ha) and coal developments (650,000 ha).

5 Amount of land required to sustain harvests of 13.1 million cubic metres per ear, which represents the actual harvest in 1993/94.

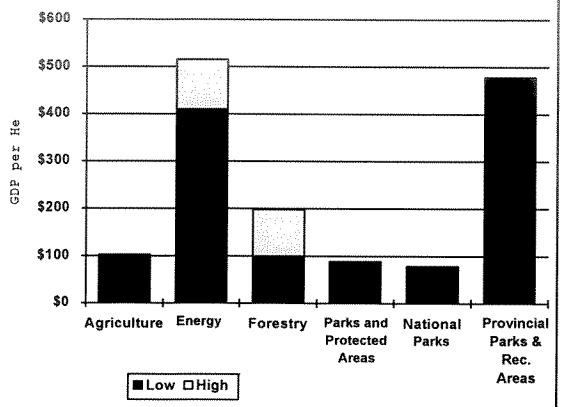
6 Based only on expenditures by visitors to parks and protected areas and excludes the effects of government expenditures to operate these areas.

7 Includes all designated provincial parks and provincial recreation areas for which park attendance is available

generated about $103 per hectare. This is about the same as the low end of the range for the forestry sector. However, agriculture produces more jobs per 100 km^2 - about 45 - because it is more labour intensive than forestry.

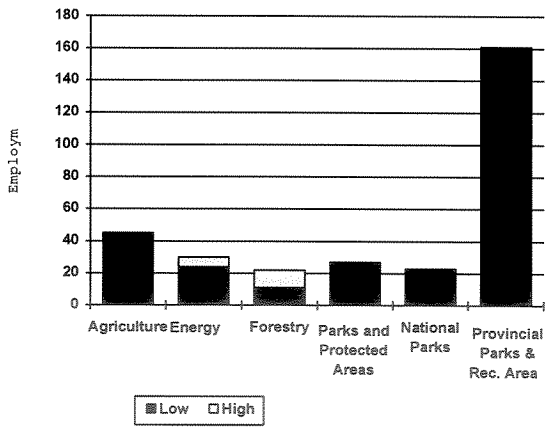
In comparing the agriculture and forestry sectors, it should be noted that economic production can be derived from most of the agricultural land base each year. In contrast, forestry companies operate on a sustained yield basis that allows them to harvest only about one percent of their total land base each year.

Figure 8
Average Gross Domestic Product Per Hectare of Land, 1993



The corresponding information on average impacts per land area for various types of parks and protected areas is provided in Table 10. The data show that, on average, parks and protected areas (for which data are available) directly contribute an average of about $89 per hectare toward provincial GDP and create 27 person-years of employment per 100 km^2. As shown in Figure 8, the average GDP contribution for parks and protected areas is slightly less than the equivalent estimates for agriculture ($104) and the low estimate for the forestry sector ($100).

Figure 9
Average Employment Per 100 Square Kilometres, 1993



In terms of direct impacts on employment, Figure 9 shows parks and protected areas create at least 25 percent more jobs per square kilometre than does the forest sector, and may be as much as 1.5 times greater. The high employment effects associated with parks and protected areas are the result of the numerous seasonal and part time jobs and lower wages in the tourism industry. Direct employment effects associated with parks and protected areas are similar to those of the energy sector, but only half that of agriculture.

Further analysis shows that the magnitude of impacts on GDP and employment varies considerably between national parks and provincial parks and recreation areas. Table 10 shows that provincial parks and recreation areas, which tend to be fairly small areas used intensively for recreational purposes, make extremely high economic contributions per unit area. Average GDP for these designations is about $479 per hectare. This value is equivalent to that of the energy sector and two to four greater than either agriculture or forestry (see Figure 8).

In terms of employment, provincial parks and recreation areas generate an average of 161 person-years per 100 km^2. This is at least five times greater than either the energy or forestry sectors and 3.5 times larger than employment in the agriculture sector (Figure 9). As noted above, these high employment effects occur because recreation and tourism services are highly labour intensive and produce numerous seasonal and lower paying jobs.

The data in Table 10 also show that the economic contributions per unit of land in the national parks in Alberta are much lower than those for provincial parks and recreation areas. Average GDP is calculated to be $79 per hectare, with an average of 23 person-years of employment per 100 km^2. These values are very close to the overall average for parks and protected areas in Alberta, because visitors to national parks are responsible for the majority of economic impacts (see Figure 5) and because national parks account for such a large proportion of the total land area for parks and protected areas in Alberta.

Part of the difference between national parks and provincial parks and recreation areas can be explained by the much greater size of national parks and the lower intensity of recreational activity that occurs. For example, Wood Buffalo National Park, at 4.4 million hectares,[1] is the largest park in Alberta and Canada but is only visited by about 7,000 people each year. Their expenditures contribute very little toward the Alberta economy in terms of employment and GDP. At the other extreme, Ma-Me-O Beach Provincial Park, which is 1.6 hectares in size, was visited by about 9,200 people in 1993/94.

5.3 Summary

Assessing economic impacts in terms of land allocations represents an alternative approach for making comparisons of the relative importance of various sectors of the provincial economy. Using data for 1993/94, this analysis shows that, on average, parks and protected areas directly contributed nearly as much provincial GDP per hectare as did forestry and agriculture.

[1] About three-quarters of this park is located in Alberta.

Furthermore, parks and protected areas directly generated as much employment per land area as did the forestry and energy sectors.

Even if indirect and induced effects are considered, the analysis yields nearly the same general results. As shown in Table 11, spending by visitors to parks and protected areas in Alberta generated nearly as much total GDP and employment per unit of land hectare as did the forest sector.

Table 11
Average Contributions of Various Resource Sectors Toward GDP and Employment in Alberta, by Land Area, 1993

	Direct GDP/ hectare	Direct PYs/ 100 km^2	Total* GDP/ hectare	Total* PYs/ 100 km^2
Agriculture	$103	45	$259	76
Energy	$410-$515	24-30	$755-$950	85-107
Forestry	$100-$198	11-22	$207-$415	33-65
Parks and Protected Areas	$89	27	$191	44
National Parks	$79	23	$155	35
Prov. Parks and Recreation Areas	$479	161	$938	243

* Includes direct, indirect and induced impacts

A number of factors have to be considered when interpreting these results. First, the analysis considers average values which do not describe the possible range of values that may occur within each sector. Second, estimates of the land base are difficult to confirm, especially for the energy sector. Third, no allowances are made for multiple activity on forested lands.

It must also be noted that the estimates of the economic impacts associated with parks and protected areas do not provide a complete assessment of their economic contributions. The effects of government expenditures to operate and maintain these areas have not been included. In addition, the estimates are based on the 85 percent of parks and protected areas for which park visitation estimates are available. While some recreational or tourist activities are likely to occur on the remaining 15 percent, the extent of these activities and their economic impacts is unknown. However, even if there were no activity on these sites, the $975 million in GDP spread over all 6.5 million hectares of protected areas in Alberta still suggests an average value of $150 per hectare per year for tourism and recreation, and average employment of 34 person-years per 100 km^2.

6.0
Comparison to Other Provinces

A similar analysis of the economic importance of parks and protected areas in other provinces was undertaken as a means of verifying and interpreting the analysis presented in Section 5.0. Such a comparison is difficult to make because each province uses a different set of park classifications and measures the amount of recreational activity in different ways. In addition, the economic contributions of national parks and other protected land designations in the other provinces are also very difficult to quantify.

However, an analysis of available information indicates that the estimates of the economic contributions of provincial parks and recreation areas in Alberta are considerably higher than similar estimates prepared for parks systems in Ontario, British Columbia and Saskatchewan (see Table 11).

Data for British Columbia come from two recent studies. The first study (Coopers & Lybrand Consulting, 1995) suggests average GDP contributions of $62 per hectare for their parks and ecological reserves in 1993.[1] Total employment impacts amount to 14 jobs per 100 km^2. The second study, conducted for the following year (1994), showed a six percent increase in the area of the park system, a 12 percent increase in visitation, and a four percent increase in GDP (Coopers & Lybrand Consulting, 1996). However, the economic impact per hectare remained about the same.

In 1988, there were 3.7 million visitors to natural environment, recreation and wilderness provincial parks in Saskatchewan (Saskatchewan Environment and Public Safety, 1991). The economic impacts associated with these parks amounted to $45 in GDP per hectare and 13 person-years of employment per 100 km^2.

A recent study of the economic impact of Ontario provincial parks (OMNR, 1992) suggests average employment of 19 jobs per 100 km^2 of parks. Data from this report also suggest that the Ontario provincial parks

[1] All the provincial studies include direct, indirect and induced effects in their analysis and also include the effects of government spending to operate and maintain their parks systems.

Table 12
Characteristics of Parks in Alberta, British Columbia, Saskatchewan and Ontario

	Size (millions ha)	Visitor-Days (millions)	Total Impact on GDP (millions)	Total Impact on Employment	GDP per Hectare*	Employment per 100 km^2
Alberta Provincial Parks and Recreation Areas-1993	0.2	9.1	$179	4,670	$938	243
Alberta National Parks - 1993	5.4	12.7	$882	19,810	$163	37
B.C Parks- 1993	6.5	22.7	$402	9,300	$62	14
- 1994	6.9	25.5	$419	9,500	$61	14
Saskatchewan - 1988	1.0	3.7**	$45	1,310	$45	13
Ontario Provincial Parks-1992	6.3	7.0**	$416	12,000	$66	19

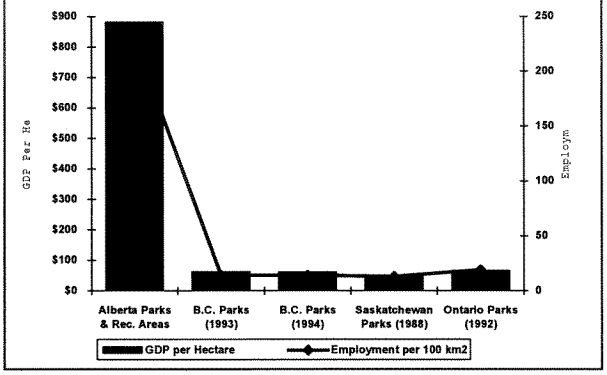
* No attempts have been made to adjust estimates to a common year in order to account for inflation, but this would have only a minor effect on the estimates of GDP per hectare.
** Reported as trips to parks rather than as visitor-days.

system contributes about $66 per hectare toward provincial GDP.[1]

A simple comparison of the economic impact information for the parks systems in other provinces shows considerable similarity among British Columbia, Saskatchewan and Ontario (see Figure 10). However, the estimated impacts for provincial parks and recreation areas in Alberta are more than 10 times greater.

One reason for this difference appears to be the higher intensity of recreational activity and associated visitor expenditures in Alberta as compared to the other provinces. The estimate for Alberta is based on provincial parks and recreation areas which have a combined size of only 144,100 hectares. With about 9.1 million reported visitor-days, this represents an average of about 63 visitor-days per hectare of land.

Figure 10
Economic Contributions of Provincial Parks and Protected Areas in Other Provinces



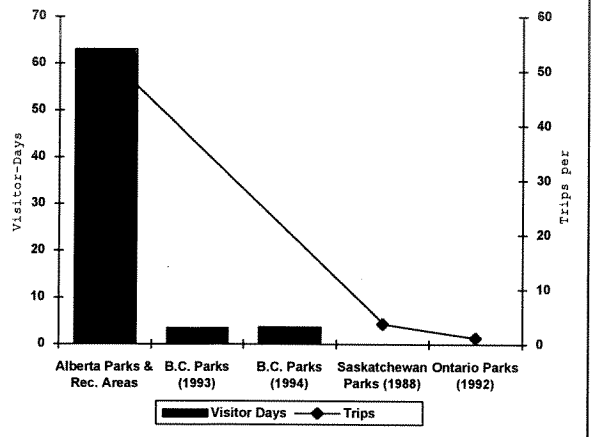
In comparison, BC had 6.3 million hectares of land in provincial parks and ecological reserves in 1993. Based on 22.7 million visits to BC parks, the average intensity of

[1] The Ontario report measures the impact of their parks system in terms of gross output, which amounted to an average of $132 per hectare. Since gross output is usually about 2.0 to 2.5 the impact on provincial GDP for the personal and business service sectors, it was assumed that average GDP for Ontario parks was between $53 and $66 per hectare,

use is only four visitor-days per hectare - less than one tenth the Alberta level. If average trip costs are about the same in both provinces, the higher intensity of use clearly explains why the average impact per hectare in Alberta is 10 times greater.

It is difficult to derive comparable estimates of visitation intensity for Saskatchewan and Ontario because they report their attendance data in terms of trips rather than visitor-days. However, a rough estimate can be made by assuming that camping trips in Alberta last an average of 4.0 days.[1] With this assumption, it is estimated there were about 7.7 million trips to Alberta provincial parks and recreation areas in 1993/94, or about 53 trips per hectare.

Figure 11
Intensity of Use of Provincial Parks and Protected Areas in Alberta and Other Provinces



In comparison, the average for Saskatchewan was about four people per hectare while Ontario statistics suggest an average of only one person per hectare. While some of these differences may occur because of variations in how visitation statistics are collected, it would appear (Figure 11) that Alberta parks and recreation areas are used more intensively than parks in other provinces. This helps explain why estimates of GDP per hectare are so much higher for Alberta parks and recreation areas.

This observation leads to an important conclusion about the nature of the Alberta system of parks and protected areas. The analysis suggests that, when compared to the other three provinces, Alberta's system of protected areas is more focussed toward intensive recreational activities. The other provinces have created parks systems that, on average, are used less intensively and feature more land areas that are designated for purposes of environmental protection rather than intensive recreation and tourism development. However, the Alberta Special Places 2000 program is gradually expanding the system of protected areas to include more lands that stress ecosystem protection rather than intensive recreation development.

[1] This was reported in a survey of visitors to provincial parks and recreation areas in Alberta. See Thompson Economic Consulting Services, 1987.

7.0
Conclusion and Discussion

Three general conclusions can be drawn from this analysis.

First, existing parks and protected areas do make an important contribution to the economy of Alberta. These contributions arise mainly from the expenditures of Alberta residents and tourists who purchase a variety of goods and services during trips to parks and protected areas. Visitor spending, combined with the costs of operating and maintain the system of parks and protected areas in Alberta, accounted for at least 1.5 percent of Alberta gross domestic product and 2.0 percent of provincial employment in 1993.

Second, the extent to which parks and protected areas contibute toward provincial GDP and employment is actually fairly large relative to the amount of land allocated to these uses. When compared to other resource sectors in terms of their impacts per unit of land, parks and protected areas were found, on average, to contribute nearly as much as forestry and agriculture in terms of GDP, and more than forestry in terms of employment. Where there is intensive recreational activity (such as provincial parks and recreation areas), average contributions to GDP and employment per unit of land can be many times larger than the average values for agriculture and forestry. The analysis shows that, even when using a modest estimate of their economic contributions, the Alberta system of protected areas generates on average nearly as much economic activity per hectare of land per year as do other forms of resource development.

Third, these results are not unique to Alberta. Parks and protected areas in other provinces also make relatively large contributions toward GDP and employment, when calculated per unit of land. However, the estimates for Alberta are substantially higher than for British Columbia, Saskatchewan and Ontario. These higher numbers reflect the fact that parks and protected areas in Alberta are used much more intensively for recreational purposes than are parks in the other provinces.

7.1 Discussion

These findings now offer an additional argument in support of environmental protection. Aside from protecting key parts of Alberta's natural and cultural heritage, programs like Special Places 2000 may, depending on the circumstances, lead to economic activity and employment that may be equal to or greater than conventional

types of resource development. However, these findings should not be interpreted to mean that protection should always be given priority over development whenever there are conflicting land uses. There are several reasons for this.

First, much of this analysis has dealt with average values per hectare for each of the sectors. However, decisions about creating additional protected areas should consider the additional or marginal impacts that might result on a case by case basis. Some lands may have higher-than-average values for forestry or agriculture or energy[1], and these charactersitics must be considered when making land use decisions.

Second, in the case of parks and protected areas, these marginal economic impacts are difficult to predict because it is not known how the demand for recreation in Alberta would be affected by an increase in the amount of parks and protected areas. If current levels of use are constrained by lack of facilities or land base, expansion of the system may generate additional visitation and create additional economic impacts. However, this relationship is not necessarily linear and numerous other factors can affect visitation and economic impacts. Until more is known about the relationship between recreation supply and demand, it is very difficult to predict how the economic contributions of protected areas system will change in response to additions to or deletions from the system.

For example, British Columbia increased the size of their park system by six percent between 1993 and 1994, resulting in a 12 percent increase in visitation and a four percent increase in park-related GDP. The exact reasons for these increases are not clear. They could be due to population growth, higher income levels, more tourist promotion, or even good weather. However, it is likely that expansion of the park land base had some effect on visitation and the associated economic activity.

Third, impacts on GDP and employment are not the best measures of economic value to be used in making resource allocations. Although GDP is commonly used to describe the economic merits of a development proposal, it is more appropriate to consider project benefits and costs. GDP calculations do not differentiate between benefits and costs as long as these activities generate business. As noted earlier, the costs of cleaning-up an oil-spill represent a gain in GDP because of the consumption of goods and services required to complete the clean-up. Similarly, employment effects are often measured in gross terms and ignore the

[1] This is of special concern in the case of energy where lands with producing wells will have economic values that are many times higher than areas where exploration is occurring.

fact that job creation in one sector may have resulted in job losses somewhere else.

Fourth, this analysis has treated land allocations as single use, yet multiple uses often occur. Energy development occurs on lands used for forestry and agriculture, and even in some provincial parks. Similarly, a wide range of recreational activities occur in areas being managed for timber production. Opportunties for multiple uses must be considered when making land allocations.

In order to determine the best use of resources, a benefit/cost framework that measures the net incremental benefits of a project is the preferred evaluation tool. However, to be most effective, such a framework must consider both market and non-market benefits and costs. Non-market benefits are particularly important in the case of protected areas and recreation. Most people enjoy benefits over and above their actual recreation expenditures but these types of benefits (termed consumers' surplus) are difficult to measure and are certainly not included in GDP calculations. For British Columbia, the consumers' surplus associated with parks and protected areas in 1994 was determined to be $761 million, which is 1.8 times the estimated contribution to GDP.[1] Were these non-market benefits to be added to the GDP contributions described earlier, parks and protected areas could have values per hectare that are well above the economic benefits associated with other types of land development.

Similarly, a comprehensive benefit/cost framework should also incorporate any costs associated with reductions in environmental quality or biodiversity. These costs also occur outside the economic market and are often quite significant for the conventional forms of economic development, like agriculture and forestry, but can be relatively smaller in the case of recreation and tourism. These types of costs are also not included in current GDP accounts.

How then can the results of this analysis be put to any use? The most important lesson that can be learned from this analysis is that the conventional assumption that any land allocated to parks or protected areas may represent a loss of provincial economic opportunities is simply not true. Depending on the circumstance, creation of a park or other protected area may contribute as much to the provincial economy as agriculture, forestry or energy development. This is particularly important in terms of employment effects because the service and retail sectors that benefit from spending by parks visitors are much more labour

[1] Coopers and Lybrand Consulting. 1996. Current and Future Economic Benefits of British Columbia Parks. Report for the British Columbia Ministry of Environment, Lands and Parks.

intensive that the forestry and energy sectors.

The results of the analysis mean that more attention has to be paid to assessing the recreation and tourism implications of proposed developments in economic terms. This is especially important in the long term because tourism and recreational use of the land may be more capable of sustaining a flow of economic benefits than energy, agriculture or forestry. As noted earlier, these assessments have to be done on a case by case basis to reflect the unique circumstance of each particular situation, including opportunities for multiple use.

7.2 Other Considerations

One other important point has become apparent through the preparation of this paper. There seems to be an inherent bias in our system of national accounts that hides or diguises the importance of parks and protected areas. As currently structured, these accounts provide annual reports on the health of the conventional resource sectors and provide a means for governments to gauge the effects of their management decisions. Unfortunately, the economic contributions of parks and protected areas are hidden within the retail, wholesale, service and other sectors so that, unless studies such as this are undertaken, the real importance of recreation and tourism goes unreported. Without regular reporting, it is very difficult to actively or successfully manage what, based on this analysis, appears to be an important part of the provincial economy.

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Appendix A:
PROTECTED CROWN LANDS IN ALBERTA

PROTECTED CROWN LANDS IN ALBERTA

	Number	Acres	Hectares	Sq. Km.	Sq. Miles	% of Province
Special Places 2000 Categories						
National Park	5	13,364,255	5,408,440	54,084.40	20,881.65	8.18%
Wilderness Area	3	249,544	100,989	1,009.89	389.91	0.15%
Ecological Reserve	14	67,046	27,133	271.33	104.76	0.04%
Wilderness Park	1	1,135,847	459,671	4,596.71	1,774.76	0.70%
Provincial Park	65	354,364	143,409	1,434.09	553.69	0.22%
Natural Area	123	93,223	37,727	377.27	145.66	0.06%
National Wildlife Area	4	104,711	42,376	423,76	163.61	0.06%
TOTAL	215	15,368,990	6,219,745	62,197.45	24,014.04	9.41%
Other Designations						
Provincial Historic Resource- Natural Site	6	2,469	999	9.99	3.86	0.00%
National Historic Site	6	566	229	2.29	0.88	0.00%
Migratory Bird Sanctuary	4	34,977	14,155	141.55	54.65	0.02%
Provincial Wildlife Sanctuary	2	47,208	19,105	191.05	73.76	0.03%
Provincial Bird Sanctuary	7	178,457	72,228	722.28	278.87	0.11%
Wildlife Habitat Development Area	2	5,651	2,287	22.87	8.83	0.00%
Forest Land Use Zone	10	1,241,502	502,429	5,024.29	1,939.85	0.76%
Provincial Recreation Area	200	147,561	59,717	597.17	230.56	0.09%
Forest Recreation Area	188	299,979	121,400	1,214.00	468.72	0.18%
TOTAL	425	1,958,388	792,549	7,925.49	3,059.98	1.20%
Integrated Resource Plan (IRP) Zoning						
In Eastern Slopes						
Prime Protection		1,612,080	652,400	6,524.00	2,518.88	0.99%
Critical Wildlife		1,630,289	659,769	6,597.69	2,547.33	1.00%
Outside Eastern Slopes		674,089	272,800	2,728.00	1,053.26	0.41%
TOTAL		3,916,458	1,584,969	15,849.69	6,119.47	2.40%
Reservations						
Forest Recreation Area (PNT/CNT)	263	651,427	263,629	2636.29	1,017.86	0.40%
Ecological Reserve	2	10,351	4,189	41.89	16.17	0.01%
Provincial Park/Recreation Area (PNT)	23	127,973	51,790	517.90	199.96	0.08%
Provincial Park/Recreation Area (CNT)	9	367,361	148,669	1,486.69	574.00	0.22%
Natural Area (PNT/CNT)	162	222,059	89,866	898.66	346.97	0.14%
TOTAL	459	1,379,171	558,143	5,581.43	2,154.96	0.84%
OVERALL TOTAL		22,623,007	9,155,406	91,554.06	35,348.45	13.85%

Notes:

1. Area of Province - 661,185 square kilometres.
2. Some overlap exists between land held under reservation and IRP Zoning.
3. CNT - Consultative Notation
4. PNT - Protective Notation

Management Support Division, Albertan Parks Services

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NOTES

- What percent of tourist spending is related to parks and protected area?

  According to studies by Alberta Economic Development and Tourism

Spending by residents in 1991	$3,186,740,900
Spending by non-residents in 1990	$1,331,900,000
Total spending	$4,518,640,900
Visitor spending at parks and protected areas	$1,113,000,000
Percent of total spending	25%

- What is the effect of excluding Wood Buffalo National Park?

Banff National Park	6,641 km^2
Jasper National Park	10,878 km^2
Waterton Lakes National Park	525 km^2
Elk Island National Park	195 km^2
Total Area - National Parks	18,239 km^2
Direct Impacts - National Parks	$427,000,000
GDP/hectare -National Parks	$234/$460
Employment/100 km^2 - National Parks	70/103
GDP/hectare - All Parks	$252/$496
Employment/100 km^2- All Parks	77/113

- How many visitors required to generate $100 in direct GDP per hectare of land?

Total park visitation	24.6 million
Total park area	5,552,540 ha
Average visitation/ha	4.43 days
Direct impacts	$89/ha
Visits needed for $200/ha	10